## Contents Volume 107, 1993

Research Papers	
The quartz-diorites of Limousin: Elemental and isotopic evidence for Devono-Carboniferous subduction in the Hercynian belt of the French Massif Central	
A. Shaw, H. Downes and M.F. Thirlwall	1
Partitioning and mass-balance relations in lherzolites	
J.C. Ayers	19
Effects of biotite distribution on cesium diffusion in granite	
M. Tsukamoto and T. Ohe	29
Fracture-lining manganese oxide minerals in silicic tuff, Yucca Mountain, Nevada, U.S.A.	
B.A. Carlos, S.J. Chipera, D.L. Bish and S.J. Craven	47
Tetrad effect in lanthanide partitioning between calcium sulfate crystal and its saturated solution	
H. Kagi, Y. Dohmoto, S. Takano and A. Masuda	71
The analysis of forms of sulfur in ancient sediments and sedimentary rocks: comments and cautions	
C.A. Rice, M.L. Tuttle and R.L. Reynolds	83
Determination of sodium, chloride and sulfate in dolomites: a new technique to constrain the composition of dolomitizing fluids	
W.J. Staudt, E.J. Oswald and M.A.A. Schoonen	97
Vegetation-induced, subsurface precipitation of carbonate as an aggradational process in the permanent swamps of the Okavango (delta) fan. Botswana	
T.S. McCarthy, W.N. Ellery and K. Ellery	111
A study of the microwave treatment of water samples from the Elbe River, Bohemia, Czech Republic T. Paukert and Z. Sirotek	133
Isotope Geoscience Section	
Research Papers	
An investigation into the cause of memory effects associated with the conversion of H <sub>2</sub> O to H <sub>2</sub> for D/H measurement	
A.D. Morse, I.P. Wright and C.T. Pillinger	147
Stable isotopic biogeochemistry of carbon and nitrogen in a perennially ice-covered Antarctic lake R.A. Wharton, Jr., W. Berry Lyons and D.J. Des Marais	159
Potassium-argon dating of fine-grained basalts with massive Ar loss: Application of the 40Ar/39Ar technique to	
plagioclase and glass from the Kirkpatrick Basalt, Antarctica	177
K.A. Foland, T.H. Fleming, A. Heimann and D.H. Elliot	1/3
A new approach for the determination of the age of partial or complete homogenization of Pb isotopes —	
Example: anchimetamorphic, detrital sediments of the Central Iberian Zone, Spain	
T.F. Nägler, HJ. Schäfer and D. Gebauer	191
Book Reviews	
Chemistry of the Solid-Water Interface: Processes at the Mineral-Water and Particle-Water Interface in Natural	
Systems, by W. Stumm — P.J. Wangersky	201
Sedimentary Petrology (2nd ed.), by H. Blatt — R. Cas	
Special Issue "Geochemistry of the Earth Surface", by L.R. Kump (Guest-Editor)	
Introduction by I. P. Kump (Guest-Editor)	111

## Section 1 - Sediments, Paleosols, and Paleo-CO2

Modelling of atmospheric CO <sub>2</sub> consumption by chemical weathering of rocks: Application to the Garonne, Congo and Amazon basins	
P. Amiotte Suchet and J.L. Probst	205
$\delta^{13}$ C composition of sediments from the Sanaga River, Cameroon	
M.I. Bird, P. Giresse and A.R. Chivas	211
Enhancement of silicate weathering rates by vascular land plants: quantifying the effect	
M.F. Cochran and R.A. Berner	213
A steep, mid- to late Paleozoic decline in atmospheric CO2: evidence from the soil carbonate CO2 paleobarometer	
C.I. Mora and S.G. Driese	217
A much warmer Earth surface for most of geologic time: Implications to biotic weathering	
D.W. Schwartzman and M. McMenamin	221
Processes controlling the <sup>14</sup> C content of soil carbon dioxide: Model development	
Y. Wang, R. Amundson and S. Trumbore	225
Section 2 — Geochemical and Isotopic Record of Continental Weathering	
Rhythmic lacustrine sequences with silcretes from the Madrid Basin, Spain: Geochemical trends M.A. Bustillo and M. Bustillo	229
Isotopic tracers of nitrogen from atmospheric deposition to coastal waters	227
M.L. Fogel and H.W. Paerl	233
The oxygen isotope geochemistry of kaolinites from lateritic profiles: implications for pedology and	200
paleoclimatology	
S. Giral, S.M. Savin, JP. Girard and D.B. Nahon	237
Patterns of distribution and behaviour of trace elements in bauxites	
L.E. Mordberg	241
Impact of crystalline basement magmatic rock composition on the geochemistry of bauxite types	
L.E. Mordberg	245
REE mobilization, fractionation and precipitation during weathering of basalts	
M.I. Prudêncio, M.A.S. Braga and M.A. Gouveia	251
A possible link between the seawater osmium isotope record and weathering of ancient sedimentary organic	
matter	
G. Ravizza and B.K. Esser	255
Ferricretes as a source of continental oolitic ironstones in northern Sudan	
T. Schwarz and K. Germann	259
Geochemical record of the climate effect in sediments of the China Shelf Sea	
YY. Zhao and MC. Yan	267
Section 3 — Weathering and Pedogenesis at the Watershed Scale	
Zircon: an immobile index in soils?	
F. Colin, C. Alarçon and P. Vieillard	273
Degradation and dismantling of iron crusts under climatic changes in Central Africa	=
A. Beauvais and Y. Tardy	277
Silicate weathering and base cation export in granitic watersheds, Sierra Nevada, California, U.S.A.	
A.D. Brown	281
Gold mass transfer during lateritic weathering under equatorial rainforest conditions	
F. Colin and J.P. Ambrosi	285
Weathering and pedogenesis at the watershed scale: high-elevation catchments in silicate terrains	
J.I. Drever and J.B. Finley.	289
Behavior of REE and other trace and major elements during weathering of granitic rocks, Évora, Portugal	
M.A. Gouveia, M.I. Prudêncio, M.O. Figueiredo, L.C.J. Pereira, J.C. Waerenborgh, I. Morgado, T. Pena	
and A. Lopes	293

Experimental study of gold precipitation with synthetic iron hydroxides: HRTM-AEM and Mössbauer spectroscopy investigations	
C. Greffie, C. Parron, M. Benedetti, M. Amouric, P. Marion and F. Colin	297
A comparative study of biotite weathering from two different granitic rocks	
L.C.J. Pereira, J.C. Waerenborgh, M.O. Figueiredo, M.I. Prudêncio, M.A. Gouveia, T.P. Silva, I. Morgado and	201
A. Lopes	. 301
The weathering crust in the Vuotso-Tankavaara area — The first evidence on the occurrence of halloysite in	
Finland	207
V. Peuraniemi and Md. Riajul Islam  Preglacial weathering crust in Ostrobothnia, western Finland, with special reference to the Raudaskylä occurrence	. 307
V. Peuraniemi and P. Pulkkinen	313
Water chemistry and chemical weathering in northern Venezuelan drainages	
A.J. Ramirez and A. Andara	317
Hydrologic, chemical, and isotopic characterization of two small watersheds on Catoctin Mountain, north-central	
Maryland, U.S.A.	
K.C. Rice and O.P. Bricker	319
Gold: a useful tracer in sub-Sahelian laterites	
A. Sanfo, F. Colin, M. Delaune, B. Boulangé, J.C. Parisot, R. Bradley and J. Bratt	. 323
Changes in mineralogy and geochemistry of a nepheline syenite with increasing bauxitization, Pocos de Caldas,	
Brazil	
A. Schumann.	327
Hydroclimatology and biogeochemistry of the Amazon 1. Erosion	
Y. Tardy, J. Mortatti, R. Victoria, L. Martinelli, A. Ribeiro, C. Cerri, M. Piccolo, J.L. de Moraes, J.L. Probst,	
F. Andreux and B. Volkoff	333
Weathering and pedogenesis at the watershed scale: Some recent lessons from studies of acid-deposition effects  M.A. Velbel	337
Chemical weathering and the formation of pseudo-karst topography in the Roraima Group, Gran Sabana, Venezuela	
C.E. Yanes and H.O. Briceño	341
Chemical denudation and weathering mechanisms in central Massachusetts, U.S.A.	
R. Yuretich, E. Knapp and V. Irvine	345
Geochemistry and dynamics of calcrete genesis in semi-arid regions Y. Wang, D. Nahon and E. Merino	349
Section 4 — Kinetics of Mineral Growth and Dissolution	
A multivariate linear regression model for the comparison of field- and laboratory dissolution data  C. Anbeek	355
Kinetics of silica sorption on North Sea sediments	200
M. Gehlen, W. van Raaphorst and R. Wollast	359
The difference between the solubility of quartz and chalcedony: the cause?	
S.R. Gíslason, P.J. Heaney, D.R. Veblen and K.J.T. Livi	363
Section 5 — Global Biogeochemical Cycles	
A case for geochemical control of concentration-discharge relationships	
S.P. Anderson, W.E. Dietrich, R. Torres, D.R. Montgomery and K. Loague	369
Weathering and its effect on atmospheric CO <sub>2</sub> over Phanerozoic time  R.A. Berner	373
Phosphorus and phosphate-rich sediments, an environmental approach	
K.B. Föllmi	374
Rare earth element distribution in sediments from the Minho river and estuary (Portugal) — a preliminary study	
M.A. Gouveia, M.F.D. Araújo and J.M.A. Dias	379
Sorption of organic matter to mineral surfaces and the preservation of organic matter in coastal marine sediments	
R.G. Keil and J.I. Hedges	385

Global nitrogen cycle within the coupled C-N-P system	
A. Lerman, F.T. Mackenzie and L.M. Ver	389
Geochemical mass balances of major chemical constituents in Bohai Sea water	
Y. Li and J. Rao	393
Phosphorus dynamics in the Amazon river and estuary	
JL. Rao and R.A. Berner	397
The significance of biogenic element cycling in ancient tropical soils	
A.W. Rose, T. Kato and M.L. Machesky	401
Reassessment of the oceanic residence time of phosphorus	400
K.C. Ruttenberg	405
Hydroclimatology and biogeochemistry of the Amazon 2. Geochemical cycles	
Y. Tardy, J. Mortatti, R. Victoria, L. Martinelli, A. Ribeiro, C. Cerri, M. Piccolo, J.L. de Moraes, J.L. Probst,	411
F. Andreux and B. Volkoff	411
Section 6 — Environmental Geochemistry	
Behaviour of nickel and cobalt in natural waters of granitic areas: a first approach	
N. Gassama, G. Michard, C. Beaucaire and G. Sarazin	417
Heavy metals in the sediments of the Aveiro lagoon (Portugal): sources and relationships with clay minerals	
C.S.F. Gomes and H.M.S. Delgado	423
Dissolved and gaseous contaminant transport in salt deposits	
A. Lerman and P.A. Domenico	427
Mobil metallic elements in a urbanized tropical catchment, Lake Valencia, Venezuela	
J.L. Mogollón and C. Bifano	431
Section 7 — Early Diagenesis of Sediments	
Influence of terrestrial weathering or early discounting in continuental shalf additionate	
Influence of terrestrial weathering on early diagenetic reactions in continental shelf sediments  R.C. Aller	427
Effects of discontinuous vs. continuous irrigation on dissolved silica fluxes from marine sediments	43
B.P. Boudreau and R. Marinelli	420
Speciation and isotopic composition of sulfur in the Oxford Clay Formation (Jurassic, U.K.)	435
T. Chu, L.M. Bonnell and T.F. Anderson	442
A comparison of organic matter sources, diagenesis and preservation in oxic and anoxic coastal sites	44.
G.L. Cowie and J.I. Hedges	447
Early diagenesis in Canadian Shield lakes	44
JF. Gaillard	453
Mineralogy and geochemistry of sedimentary bentonites related to alluvial fan arkosic facies (Neogene Madrid	75.
Basin, Spain)	
M. Pozo, A. Moreno, J. Casas and J.A. Martin Rubi	45
A model of early diagenesis in the tropical North Atlantic: Processes and mass balances in the sediments of the	43
EUMELI program	
C. Rabouille, P. Crassous, A. Kripounoff, JF. Gaillard, R. Jahnke, C. Pierre and JC. Relexans	46
Kinetic controls on depth variations in localised pyrite formation	10.
R. Raiswell	46
Organic matter mineralization and nutrient fluxes at the sediment-water interface of a eutrophic lake (Aydat	
Lake, Puy de Dôme, France)	
G. Sarazin, JF. Gaillard, L. Philippe and C. Rabouille	47
Phosphate adsorption in oxidized marine sediments	**** ***
C.P. Slomp and W. van Raaphorst	47
Section 8 — Organic Geochemistry	
Molecular-level characterization of marine-derived sedimentary organic matter by alkaline CuO oxidation:	
sources and reactivities of organic matter from Skan Bay (Alaska) sediments	
M.A. Goñi and J.I. Hedges	48

Sedimentary diagenesis: organic perspectives with inorganic overlays	
J.I. Hedges, R.G. Keil and G.L. Cowie	. 487
Paleoecological reconstructions in southern Egypt based on the stable carbon and nitrogen isotopes in the organic fraction and stable carbon isotopes in individual amino acids of fossil ostrich eggshell	
B.J. Johnson, M.L. Fogel and G.H. Miller	. 493
Distribution and significance of dicarboxylic acid anions in oil field waters	499
Y.K. Kharaka, G. Ambats and J.J. Thordsen	
The chemical composition of dissolved organic matter in seawater	
M.D. McCarthy, J.I. Hedges and R. Benner	. 503
Contents Volume 107, 1993	. 509